



**Testimony of Mark Reis,
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before the

House Subcommittee on Aviation

“Wildlife Strikes—How Airports are Helping to Manage the Risks”

February 24, 2009

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Chairman Costello, Ranking Member Petri, and members and staff of the House Subcommittee on Aviation, thank you for allowing me to participate in this important hearing. My name is Mark Reis, and I am Managing Director of the Seattle-Tacoma International Airport (Sea-Tac). I also serve as a Member of the Board of Directors of Airports Council International-North America (ACI-NA). ACI-NA's 366 member airports enplane more than 95 percent of the domestic and virtually all of the international airline passenger and cargo traffic in North America. Nearly 400 aviation-related businesses are also members of ACI-NA, providing goods and services to airports.

We were all transfixed by the skill and professionalism of Captain Sullenberger and First Officer Skiles when they were able to land US Airways Flight 1549 in the Hudson River on January 15 after their A320 jetliner ingested birds into both of its engines. The successful evacuation of the flight by Captain Sullenberger, First Officer Skiles, and flight attendants Walsh, Dail, and Dent following the emergency landing testifies to the intensive training and consummate professionalism of our nation's airline flight crews. The Flight 1549 accident clearly highlights the threat to aviation safety from wildlife. I am here today to describe how airports have been working over almost five decades to reduce these risks within the confines of multiple federal, state, and local laws and regulations, and to highlight some of the challenges airports face while implementing wildlife hazard management programs.

Understanding Wildlife Strike Risks

Before discussing these efforts, it is important to underscore what is known about wildlife hazards with reference to the United States civil aviation industry, and to recognize that these

data are limited to what has been voluntarily reported to the Federal Aviation Administration (FAA), primarily by airport operators and the airlines. The aviation community has widely recognized that the threat to human health and safety from aircraft collisions with wildlife, called “wildlife strikes,” is increasing. This increase is especially noticeable since 1990 when the FAA began formally tracking these events using uniform guidelines to ensure each strike record was adequately screened to avoid any duplicate records in the FAA National Wildlife Strike Database.

Of the over 82,000 wildlife strikes reported during the 18-year period from 1990-2007, about 85 percent of these involved commercial aircraft with the remainder spread among business, private, and government aircraft. The number of strikes annually reported to the FAA has more than quadrupled from 1,759 in 1990 to a record high of 7,666 in 2007. This increase is thought to be a result of several factors: (1) an increased awareness that the FAA and airport operators are interested in receiving wildlife strike reports when they occur, (2) an increase in the number of civilian aircraft operations, and (3) an increase in population sizes of some wildlife species. Although birds are involved in nearly 98% of the strikes, other wildlife, such as deer, elk and alligators, in addition to smaller animals such as coyotes, have also been struck and are known to cause aircraft damage.

One of database’s most important contributions is information on aircraft altitude when these collisions are occurring: While the record height for civil aircraft striking a bird in the U.S. is 32,500 feet above ground level (AGL), strikes at altitudes above 10,000 ft AGL are known to be rare. Rather, these data show most strikes (92%) occur below 3,000 feet AGL with a majority (60%) occurring at 100 feet AGL or less. Consequently, FAA Advisory Circular 150/5200-33B,

addressing hazardous wildlife attractants on and near airports, stresses the need for airport operators to avoid, eliminate, or mitigate certain wildlife within at least 10,000 feet of the airport boundary, the area where most aircraft wildlife collisions occur.

Fortunately, wildlife strikes resulting in very serious consequences for non-military operations—as was the case for Flight 1549—have been very rare. From 1990 through 2007, the FAA has received reports of 43 aircraft hull losses—which include aircraft that crashed as well as those determined to be unflyable following the strike—as a result of wildlife strikes. Only two of these hull losses involved commercial aircraft. Over that same time, 840 million landings and takeoffs took place, representing one civilian aircraft lost for every 1.9 million landings and takeoffs. Injuries and fatalities caused by wildlife strikes were also rare—197 injuries and 16 fatalities were attributed to wildlife strikes between 1990 and 2008. During this same period, there were over 12 billion commercial passengers enplaned in the U.S., a number that would be even higher if data were available regarding the number of individuals that flew on non-commercial aircraft.

Not only can wildlife strikes be hazardous, they can also be costly. As noted by the FAA in 2004, wildlife strikes worldwide cost civil aviation an estimated \$1.2 billion annually.¹ More recent statistics released by the FAA indicate that strike-related damage and aircraft downtime cost the U.S. aviation industry \$625 million per year. I recognize that even one injured passenger is cause for concern, and while these statistics show that wildlife strikes are rare, we agree that because this problem is increasing, additional attention is merited.

¹ Advisory Circular 150/5200-32A, *Reporting Wildlife Aircraft Strikes*, FAA, December 22, 2004.

Airports Efforts to Mitigate Wildlife Hazards

Airports are important partners with the FAA and the U.S. Department of Agriculture, Animal and Plant Inspection Service, Wildlife Services (USDA Wildlife Services) in mitigating the risks that wildlife—particularly certain bird species—pose to aircraft operations. U.S. commercial service airports² are required under 14 CFR 139.337 to “undertake immediate action to alleviate wildlife hazards whenever they are detected.” Airports are also required to have a qualified wildlife biologist conduct a wildlife hazard assessment in the event that an air carrier aircraft ingests wildlife into its engines, is substantially damaged by a wildlife strike, or experiences multiple wildlife strikes, or wildlife are observed in a manner that could cause an aircraft to experience one of those situations. The FAA reviews the assessment and determines whether the airport must develop a wildlife hazard management plan, which becomes a part of the operator’s Airport Certification Manual. These plans contain specific actions that an airport will undertake to attempt to minimize or eliminate wildlife hazards through habitat modifications, land use changes, and wildlife population management. The plans must also include a training program conducted by qualified experts to provide airport staff with the knowledge and skills needed to implement the management plan.

In addition to these regulatory minimums, many U.S. airports have proactively undertaken their own wildlife hazard assessments and management plans to help manage safety risks at their facilities.

² Defined as airports that serve any scheduled or unscheduled passenger operation by an air carrier with aircraft having a capacity of more than nine passengers.

The costs of wildlife management programs vary considerably from airport to airport depending on their size, location, and surrounding habitats; some airports spend \$250,000 or more per year on their programs. Funds from the FAA's Airport Improvement Program (AIP) can be used to pay for a portion of costs associated with habitat modification projects and wildlife management equipment. However, staff costs, contractor fees, and other operating expenses associated with wildlife management programs are typically not eligible for federal funding and are borne by airports themselves.

Numerous methods are available to airports to mitigate wildlife hazards. One method that is typically employed includes habitat modification that can entail draining stormwater ponds, eliminating wildlife-attracting vegetation, and maintaining specified airfield grass heights. Airports also use wildlife exclusion methods, including netting, fencing, and installing floating covers over stormwater ponds. Scare tactics through the use of loud pyrotechnic devices, propane cannons, sirens, dogs, falcons, and non-lethal projectiles can also be beneficial to keeping wildlife away from airports. Furthermore, some airports have found capturing and relocating some species to be a useful mitigation method. Lethal removal, a method which requires a depredation permit under the Migratory Bird Treaty Act and is administered by the U.S. Department of the Interior's Fish and Wildlife Service, may also be necessary provided that endangered or threatened species are not involved and that it is done as a part of an integrated wildlife damage management program that first employs non-lethal techniques such as pyrotechnics and other scare tactics to mitigate wildlife hazards.

Sea-Tac Wildlife Management Program

At Sea-Tac, we have an extensive program in place to manage wildlife hazards. Sea-Tac is located in a highly urbanized area of Western Washington, two miles east of Puget Sound and in one of the four major migratory bird flyways found in North America. Sea-Tac has an advantage in that most of the significant wildlife habitat surrounding the airport, comprised of wetlands and forested areas, lie well below runway grade and away from the flight path of aircraft. Over the last three decades, progress has been made in reducing the attractiveness of the airport for wildlife habitation, while restoring much of the areas naturally occurring hydrologic and ecological functions. Across the country, however, wildlife issues remain as populations of some urbanized wildlife species continue to increase, thereby raising the risk of another serious aviation wildlife-related incident.

Sea-Tac's wildlife program began in 1977 when the U.S. Department of the Interior's Fish and Wildlife Service and the U.S. Air Force conducted the airport's first wildlife hazard assessment. At the time, flocks of over 50,000 European starlings were creating a serious aviation risk. The airport's organized wildlife hazard management program began with the hiring of its first airport wildlife biologist. Following establishment of the program, the number of European starlings was eventually reduced dramatically to safer levels through shooting, vegetation management, and live-trapping. In June 1989, Sea-Tac developed the first FAA-recognized wildlife hazard management plan, which has since been updated five times, most recently in 2008. In 1999, the USDA Wildlife Services actively participated in planning for the airport's 3rd runway, advising the airport on how to safely mitigate wetland losses and

stormwater detention requirements in a manner that did not increase the incidence of hazardous birds, such as waterfowl, at the airport.

Costs related to damaging wildlife strikes at Sea-Tac have remained relatively low at several hundred thousand dollars per year. Adding to the cost, a few precautionary landings occur annually. Strikes occurring at the airport per year ranged from 4 in 1977 to nearly 100 in 2008. The increased number of strikes has been attributed to several factors:

- The increased number of operations at Sea-Tac, now ranked 18th in the U.S.,
- Increased reporting of strikes after awareness was raised that FAA and the Port of Seattle are interested in receiving reports from airlines,
- Quieter aircraft engines, and
- Increased abundance of large and/or flocking birds and other wildlife species such as Canada geese, gulls, some hawks, and bald eagles.

Sea-Tac has implemented a number of measures to prevent wildlife strikes. First and foremost, habitat management has always been the main focus of the airport's efforts to reduce wildlife numbers and hazards to aviation. Sea-Tac has implemented several vegetation-related practices to prevent and manage wildlife habitat. The only plants the airport allows for landscaping are those that do not produce fruits, nuts, or berries. Xeric or low water-using plants are encouraged to avoid the need for irrigation. Grass is kept at an optimal height to decrease wildlife use of the airfield for food and cover. Sea-Tac has also worked to develop its own specialized grass mix to help dissuade waterfowl, especially geese, from using the airfield. Additionally, other than grass, no other plants are allowed inside the airport operations area.

(AOA) fence, while an increasing variety of approved plants are tolerated at greater distances from the runways.

One of the best examples of the challenges airports face balancing safe airport operations and environmental mitigation requirements is found in the Airport's years of planning efforts and subsequent implementation of wetland mitigation and stormwater management practices. With the development of Sea-Tac's 3rd runway, extensive stormwater and wetland mitigation was required by the state and federal permitting agencies. The requirement for on-airport stormwater and wetland mitigation created a set of conflicting mandates that required close coordination of multiple agencies to resolve. After years of negotiation, a package of mitigation measures was agreed to that met the environmental requirements, and, at significant additional cost, also met the airport's wildlife hazard management mandates. Wetland impacts were mitigated by focusing on the replacement of different wetland functions in different locations.

Near the airport, hydrologic functions were restored in several watersheds, while also substantially reducing wildlife attractants. On-airport wetland mitigation sites were designed to have a heavy closed canopy of trees or shrubs covering open water that would otherwise attract birds. Five miles from the airport a 70-acre wetland mitigation site with open water and wildlife habitat was created to mitigate for lost bird habitat on airport property. This allowed the airport to mitigate for the lost avian habitat, but to do so in a safe location that did not risk aircraft bird strikes.

Stormwater management requirements have created another challenge for Sea-Tac, requiring the balance of conflicting mandates for stormwater detention and wildlife hazard control. For example, open ponds used to detain stormwater attract birds. Our challenge was to design and operate these ponds in a way that minimized bird attraction. Over a several year period the airport worked with the FAA and USDA Wildlife Services to identify a best management practice that was the most cost-effective means of mitigating hazardous wildlife attractants at stormwater detention facilities while keeping long-term maintenance costs to a minimum. As a result, today most of the airport's stormwater ponds are lined to prevent excessive emergent vegetation growth and fully netted to prevent wildlife access.

In addition to habitat management, Sea-Tac and other airports undertake a variety of control actions to manage wildlife hazards. The first of these control actions is wildlife harassment. The airport holds permits issued by the U.S. Department of Interior's Fish and Wildlife Service that allow us to harass bald eagles, relocate raptors (hawks, owls, and ospreys), and lethally remove individual migratory birds that lose their "fright-flight" response. We try to maintain the fright-flight response with pyrotechnics, other noise-making/scare devices, and live rounds. Tens of thousands of birds are harassed annually by over 25 airport operations personnel and contractors trained in the use of pyrotechnics and firearms to keep wildlife separated from landing and departing aircraft. In response to coyotes, the airport has installed a new fence that has a buried section to keep coyotes outside of the active airfield. Importantly, lethal removal of native wildlife is almost never used to decrease wildlife abundance; it is used, however, to reinforce the fear response that is needed to keep the airport's scare tactics effective.

Radar Technology Is Being Tested

As has been widely reported, Sea-Tac, in cooperation with researchers at the University of Illinois, is exploring enhanced monitoring through use of an avian radar system. First installed in August 2007, the airport now uses 3 Accipiter-Sicom avian radar systems. Radar systems will soon be evaluated at Chicago O'Hare, Dallas/Fort Worth, and John F. Kennedy International Airports. Following the US Airways emergency landing, the Port Authority of New York and New Jersey announced their plans to provide radar detection capabilities at three other airports that they own—Newark Liberty International, LaGuardia, and Teterboro.

These avian radar systems act like a more powerful pair of eyes capable of seeing farther and higher than a human observer that is further restricted to daylight observation periods. This information is being used to help confirm that hazardous bird activity is not increasing near the airport's stormwater ponds and to help identify wildlife trends. Avian radar allows significant bird activity to be monitored on a daily basis and may soon provide useful real time information that can be conveyed to those conducting wildlife control activities on the airfield.

Although these radar systems have shown promise in detecting concentrations of birds in the vicinity of airports, two important question remains: (1) how much information do the air traffic controllers and pilots truly need to enhance safety, and (2) what actions if any should pilots and air traffic controllers take when concentrations of birds are found. As it currently operates today, avian radar is not yet the "silver bullet" as it detects too much bird activity, meaning we need to determine what information is best to pass on immediately to the air traffic controllers. With appropriate information screening, that capability may come -- just as wind

shear radar, a technology that took years to perfect, can now alert air traffic control to hazardous weather events. Research into these systems and the appropriate level of communication with the end users is continuing.

Conflicting Federal, State and Local Regulations Pose Problems

Careful consideration of wildlife hazards during airport planning and development efforts has also helped airports proactively manage wildlife hazards. The FAA provides guidance regarding the relationships between airport development and hazardous wildlife attractants in Advisory Circulars (ACs) 150/5200-33B, *Hazardous Wildlife Attractants on or Near Airports* and 150/5200-34, *Construction or Establishment of Landfills Near Public Airports*. Airports and the FAA apply the guidance contained in these ACs in their analysis and development of airport development alternatives. For example, at Philadelphia International Airport a short-listed runway development alternative was eliminated from further consideration because the proposed runway would require aircraft to fly over a National Wildlife Refuge, unacceptably increasing wildlife strike risks.

Although airports have a large selection of tools to use in managing what occurs on their property, they have fewer tools to use when wildlife issues involve land uses off airport property but in the airport vicinity. Local realities outside of an airport's authority—including local zoning practices, construction and land development permitting procedures, and limited lines of communication between off-airport developers and nearby airports—can result in the construction of wildlife attractants—such as stormwater detention facilities, ponds, or wildlife attracting vegetation—near airports. In other cases, airports are sited near or adjacent to wildlife

refuges, parklands, golf courses, certain agricultural areas, or open water—all of which can attract wildlife.

FAA Advisory Circular 150/5200-33B requires airports to undertake coordination with local jurisdictions and developers on proposed land uses and projects that might increase wildlife attractants at an airport. In accordance with the AC, the Port of Seattle continually seeks to be involved in these land use decisions and to establish and maintain agreements with local jurisdictions where possible. While we have been successful setting landscape standards with the city that surrounds our airport, and have cooperated with local trash transfer stations, golf courses, basin planning committees, and transportation departments, it is important to note this has been only cooperative. We have no direct authority to require any action on their part, which limits our ability to ensure a safe operating environment. Airports would benefit from having stronger, federally-mandated mechanisms to control land uses in the vicinity of their airports.

Baltimore/Washington International Thurgood Marshall Airport (BWI) is a good example of an airport that has been able to influence off-airport land uses to reduce wildlife strikes. Via Maryland laws that govern airport/land use compatibility and close working relationships with local government, the Maryland Aviation Administration—which owns and operates BWI—has worked with Anne Arundel County to specify “wildlife-resistant” design and landscaping guidelines for developments up to four miles off airport property. The airport now plays a critical role in reviewing development plans, both on and off-airport, to ensure wildlife attractants are minimized. However, the approach taken at BWI’s—which is predicated in part

on strong state regulations regarding land use in the vicinity of airports—remains more of an exception than a rule in the United States.

Another issue airports face in their efforts to protect against the risks associated with hazardous wildlife is a myriad of complex and often contradictory state and local laws and regulations regarding wildlife management and habitat protection. For example, in some cases state laws restrict the types of trapping methods that airport officials can use to manage wildlife and the use of lethal removal even when such actions are permitted under federal laws. In other cases, laws limit the ability of airports to modify or eliminate attractive habitats on or near airports, even if similar habitat could be provided elsewhere. These issues have had a stifling effect on airport efforts to control hazardous wildlife around the country.

In the case of Sacramento International Airport, the risk of criminal prosecution by state officials resulted in the airport ceasing certain wildlife removal and harassment activities. Airports in Florida have encountered a similar situation and have been working with state legislators to pass legislation that would exempt airport wildlife managers from state and local prosecution.

Within the federal realm, airports also confront contradictory and overlapping regulations. Notable among these are Clean Water Act and National Environmental Policy Act requirements relating to wetlands. These requirements, and the U.S. Army Corps of Engineers Section 404 permitting processes that apply to jurisdictional wetlands, can make it difficult, expensive, and time-consuming for airports to modify wildlife attracting wetlands on and near airports to reduce

their wildlife strike risks. Providing simpler streamlined permitting and environmental review processes in cases where safety is at stake would help airports manage wildlife hazards in a manner that better complied with existing federal aviation regulations.

I would like to acknowledge that over the past decade important headway has been made to simplify the roles and relationships among the myriad federal agencies that are involved with airport wildlife management. In 2003, a Memorandum of Agreement (MOA) was established among the FAA, the U.S. Air Force, the U.S. Army, the U.S. Environmental Protection Agency, the U.S. Fish and Wildlife Service, and the USDA. This MOA established procedures necessary for these agencies to coordinate their missions to more effectively by addressing existing and future environmental conditions contributing to aircraft-wildlife strikes throughout the U.S. Most importantly for airports, the MOA clarified the responsibilities and areas of expertise that each agency was expected to bring to the table when dealing with wildlife hazards at airports. Although MOA did bring needed clarity regarding the missions of the various agencies, at Sea-Tac we have found that that continued work is needed—particularly at the field office level—to ensure all federal agencies involved with wildlife management work with airports in an effective and coordinated fashion to reduce wildlife strike risks.

Finally, airports need funding to implement and maintain effective wildlife management programs. The FAA has provided critically important funding for setting up these programs under the AIP. However, the ongoing operating costs associated with these programs must be funded out of airport operating budgets, which are already under considerable strain in our current economic crisis.

All of these issues required concerted and coordinated efforts among airports, the FAA, USDA Wildlife Services, the U.S. Army Corps of Engineers, other federal agencies, and state and local officials to address.

Conclusion

In summary, U.S. airport operators have been long-standing partners with the FAA and the USDA Wildlife Services in efforts to protect airports from wildlife hazards. Through these and their own proactive efforts, numerous U.S. airports have developed and implemented wildlife hazard management plans to reduce the risks of wildlife to aircraft operations at and near airports. Going forward, the continued development of promising technologies, improved coordination between airports and local developers, closer coordination for wetland and stormwater mitigation for airports, better adherence to the 2003 multi-agency MOA, and harmonization of federal, state, and local wildlife management restrictions may reduce these risks further.

Mr. Chairman and Ranking Member Petri, I would like to thank you again for allowing me to testify about wildlife strikes and what airports are doing to help manage the risks associated with them. ACI-NA welcomes the opportunity to continue working with you to enhance the tools airports have at their disposal to manage these risks. Thank you and I am happy to answer any questions.